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Please find below and/or attached an Office communication concerning this application or proceeding.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/814,342
Filing Date: April 01, 2004
Appellant(s): INATOMI ET AL.

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5/11/09 appealing from the Office action mailed 12/10/08.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The amendment after final rejection filed on 5/11/09 has been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The 35 U.S.C. 112, 2nd, rejection contained in the Final Action of 12/10/08 has been withdrawn because claim 10 was canceled in the after final amendment filed 5/11/09 and entered by the Examiner.

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The rejection of claim 10 under 35 U.S.C. 102/103 in view of both cited Nakahara references has been withdrawn because claim 10 was canceled in the after final amendment filed 5/11/09 and entered by the Examiner.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,866,964	NAKAHARA et al.	3-2005
7,226,697	NAKAHARA et al.	6-2007

WO 02/082570 Nakahara et al., Oct 17, 2002.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8 and 11-12 are rejected under 35 U.S.C. 102(e)/103(a) as being anticipated by, and alternatively unpatentable over, Nakahara et al., US 6,866,964.

Nakahara teaches a secondary battery (electrochemical device) comprising at least a positive electrode, a negative electrode and an electrolyte, wherein an active material in at least one of the positive electrode and the negative electrode contains a radical compound (2:20-25). Examples of the radical compound include formulas (A1) and (A2) in column 3, lines 5-18. The radical compound may be represented by formula (A5) wherein all of the alkyls R_1 to R_4 are methyl (4:35-67). In formula (A5), X_1 and X_2 may both be an aliphatic group that is saturated or unsaturated, substituted or unsubstituted, and straight, cyclic or branched. The radical compound may be represented by formula (A8) wherein all of the alkyls R_1 to R_4 are methyl and X is an aliphatic group (5:50-6:16). See also formula (A30) at column 30. Conductive auxiliary material may be added for reducing impedance during forming an electrode layer comprising a radical compound. Examples of such a material include carbonaceous particles such as graphite, carbon black and acetylene black (25:1-10). The negative electrode collector and the positive electrode collector may be a metal foil or metal plate (25:53-61). The mixture including the radical compound and carbonaceous particles is applied to the current collector. Thus the claims are anticipated.

The claims are alternatively unpatentable. Nakahara does not explicitly teach the elected species of Formula 8 in the present specification. However, Nakahara teaches the radical compound may be represented by formula (A8) wherein X is an aliphatic group. The aliphatic group contained in the elected species is one of multiple aliphatic groups. A 35 U.S.C. 102/103 rejection is considered proper where it is unclear if the reference teaches the claimed elected invention with sufficient specificity. The elected radical compound of formula 8 is at least obvious in view of the teachings by Nakahara because no criticality has been shown for the specific aliphatic group of the claimed elected invention. Since both the claimed invention and the prior art teach similar materials (a radical compound mixed with a carbonaceous material), the covalent bond limitation of the claimed invention is considered inherent in the teachings of Nakahara.
*

Claims 8 and 11-12 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, and alternatively unpatentable over, Nakahara et al., WO 02/082570 and/or under U.S.C. 102(e)/103(a) as being anticipated by, and alternatively unpatentable over, Nakahara et al., US 7,226,697.

Note US 7,226,697 will be used to discuss the teaching of both Nakahara references since WO 02/082570 was published in Japanese.

Nakahara teaches a charge storage device such as a battery wherein a positive electrode comprises a nitroxyl compound having a structure of a nitroxyl cation moiety represented by formula (I) in an oxidized state while having a structure of a nitroxyl radical moiety represented by formula (II) in a reduced state. The reaction is

represented by formula (A) (abstract). Preferably, the nitroxyl compound is a compound containing a cyclic structure represented by general formula (1a) in an oxidized state. In formula (1a), R1 to R4 may each represent an alkyl having 1 to 4 carbon atoms and X represent a bivalent group forming a five-to seven-membered ring. Formula (1a) may be part of a polymer where X is part of a side chain in the polymer or of a main chain of the polymer. The nitroxyl compound is particularly preferably a polymer having a side chain comprising the structure represented by formula (1a) (2:10-30). A preferred nitroxyl compound is represented by formula (1) in column 3. In addition to active material, a positive electrode may comprise other known constituents; for example, a conductivity enhancing material including carbon materials such as charcoal, graphite, carbon black and acetylene black (7:45-57). The negative electrode current collector and the positive electrode current collector may be made of nickel, aluminum, copper, gold, silver, titanium, aluminum alloy or stainless steel (8:49-63). Thus the claims are anticipated.

The claims are alternatively unpatentable. Nakahara does not explicitly teach the elected species of Formula 8 in the present specification. However, Nakahara teaches the nitroxyl compound may be represented by formula (1) wherein formula (1) is part of a polymer. A 35 U.S.C. 102/103 rejection is considered proper where it is unclear if the reference teaches the claimed elected invention with sufficient specificity. The elected radical compound of formula 8 is at least obvious in view of the teachings by Nakahara because no criticality has been shown for the specific polymer group (repeat unit structure) of the claimed elected invention. Since both the claimed invention and the

prior art teach similar materials (a radical compound mixed with a carbonaceous material), the covalent bond limitation of the claimed invention is considered inherent in the teachings of Nakahara.

(10) Response to Argument

Applicant asserts both Nakahara '697 and '964 fail to disclose an electrode comprising an electrode current collector made of metal and an electrode material mixture including a carbonaceous material covalently bonded to a radical compound serving as the active material. Examiner disagrees. Both Nakahara references teach a carbonaceous material is mixed with the radical compound and then applied to a metal current collector. See discussion of references above. The Examiner has taken the position that the covalent bond limitation of the claimed invention is inherent in the teachings of both Nakahara references because the references teach an organic radical compound mixed with a carbonaceous material and applied to a metal current collector. Both the nitroxyl radical of the elected invention and the nitroxyl radical of both Nakahara references function as the electrode reaction site. Carbonaceous materials have a large number of surface functional groups. As a result, a carbonaceous material can be readily bonded with organic compounds via a covalent bond. This is admitted by Applicant on page 5 of the brief. Therefore, the covalent bond limitation of the claimed invention is inherent in the teachings of both Nakahara references because the references teach an organic radical compound mixed with a carbonaceous material and applied to a metal current collector

Applicant states that while Nakahara ‘964 mentions that an active material in an electrode mixture is chemically bonded, the electrode material mixture is bonded to a current collector, not to a conductive material. While Nakahara '964 discloses "an active material may be chemical bound to a collector" (25:57-58), Examiner only relies on this teaching to meet the claim limitation "an electrode material mixture attached on said electrode current collector". The rejection clearly states “since both the claimed invention and the prior art teach similar materials (a radical compound mixed with a carbonaceous material), the covalent bond limitation of the claimed invention is considered inherent in the teachings of Nakahara”. Applicant’s own arguments support the Examiner’s position. Page 5 of the brief states “carbonaceous materials have a large number of surface functional groups. As a result, a carbonaceous material can readily bonded with organic compounds via a covalent bond, providing the surface of the material with a high number of active materials attached thereon”. Applicant appears to be asserting that the claimed radical compound and carbonaceous material form a covalent bond, but the radical compound and carbonaceous material of the prior art does not form a covalent bond. It is unclear how Applicant reaches the conclusion the claimed two materials will have a covalent bond and the same two materials when disclosed by the prior art will not have a covalent bond. Applicant has admitted carbonaceous materials can readily bond with organic compounds via a covalent bond because carbonaceous materials have a large number of surface functional groups. The carbonaceous material and organic radical compound of Nakahara with inherently form a covalent bond.

Applicant asserts "as is well known in the chemical arts, the mere mixing of two compounds does not necessarily produce a covalent bond". However, the Examiner is not arguing that any two compounds that are mixed will produce a covalent bond. The Examiner has stated the carbonaceous material and organic radical compound of Nakahara with inherently form a covalent bond. This is supported by Applicant's own statement that carbonaceous materials can readily bond with organic compounds via a covalent bond because carbonaceous materials have a large number of surface functional groups. Applicant's argument that chemical reactions often require either light or heat to drive the reaction is not relevant to the rejection of record. Furthermore, not all chemical reactions require light or heat to drive the reaction. It is unclear what Applicant is intending to argue since the claimed invention does not recite any limitations about light or heat.

Examiner is not "assuming that the polymer itself comprises the carbonaceous material and radical compound", as asserted by Applicant. Thus the arguments at page 7, 1st & 2nd paragraphs, of the brief are moot.

Applicant argues the Nakahara references fail to teach or suggest the excellent discharge characteristics obtained via use of the present disclosure. However, evidence of unexpected results must distinguish the claimed invention (not the disclosure) over the cited prior art. Applicant has not properly compared the claimed invention with the teaching of Nakahara '697 and/or Nakahara '964. Comparative Example 1 in the present disclosure is not representative of either Nakahara reference. Furthermore, Nakahara '964 teaches a battery having the disclosed active material

mixture has a higher energy density and a larger capacity (abstract). See also Figures 3 and 4 of Nakahara '964. Nakahara '697 teaches a battery having the disclosed active material mixture has a higher energy density and can be used at a large current (abstract). See also Figures 2-4 of Nakahara '697.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/TRACY DOVE/

Primary Examiner, Art Unit 1795

July 6, 2009

Conferees:

/PATRICK RYAN/

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/Dah-Wei D. Yuan/

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